



**6386**  
**TWIN TRIODE**  
 Five-Star Tube  
 ★ ★ ★ ★ ★

**6386**  
**ET-T1113**  
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**FOR REMOTE-CUTOFF CASCODE-AMPLIFIER APPLICATIONS**

**REMOTE-CUTOFF CHARACTERISTIC**  
**9-PIN MINIATURE**

**SHOCK, VIBRATION RATINGS**  
**HEATER-CYCLING RATING**

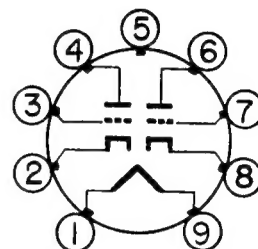
**MEDIUM-MU**

**DESCRIPTION AND RATING**

The 6386 is a miniature medium-mu twin triode in which each section exhibits a remote-cutoff characteristic. It is designed primarily for use as a cascode radio-frequency amplifier, intermediate-frequency amplifier, or mixer in circuits to which it is desired to apply automatic-gain-control. When used in cascode applications, the performance of the 6386 is characterized by high gain, low noise figure, and low higher-order harmonic distortion.

The 6386 is a special-quality tube intended for use in critical industrial and military applications in which operational dependability is of primary importance. Features of the tube include a high degree of mechanical strength and a heater-cathode construction capable of withstanding many-thousand cycles of intermittent operation. When used in on-off control applications, the tube will maintain its emission capabilities after long periods of operation under cutoff conditions.

**BASING DIAGRAM**



RETMA 8CJ

**TERMINAL CONNECTIONS**

- Pin 1—Heater
  - Pin 2—Cathode (Section 2)
  - Pin 3—Grid (Section 2)
  - Pin 4—Plate (Section 2)
  - Pin 5—Internal Shield†
  - Pin 6—Plate (Section 1)
  - Pin 7—Grid (Section 1)
  - Pin 8—Cathode (Section 1)
  - Pin 9—Heater
- † It is recommended that Pin 5 be grounded.

**GENERAL**

**ELECTRICAL**

Cathode—Coated Unipotential

Heater Voltage, AC or DC . . . . .  $6.3 \pm 10\%$  Volts

Heater Current . . . . . 0.35 Amperes

Direct Interelectrode Capacitances\*

Grid to Plate, Each Section . . . . . 1.2  $\mu\text{f}$

Input, Each Section . . . . . 2.0  $\mu\text{f}$

Output, Each Section . . . . . 1.1  $\mu\text{f}$

Heater to Cathode, Each Section . . . . . 2.6  $\mu\text{f}$

Grid to Grid . . . . . 0.003  $\mu\text{f}$

Plate to Plate . . . . . 0.11  $\mu\text{f}$

\*Without external shield.

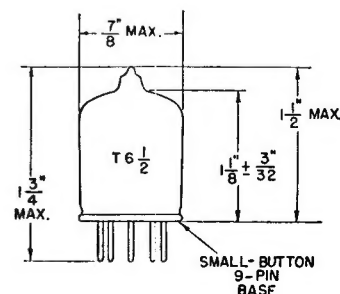
**MECHANICAL**

Mounting Position—Any

Envelope—T-6 1/2, Glass

Base—E9-1, Small Button 9-Pin

**PHYSICAL DIMENSIONS**



RETMA 6-1

## MAXIMUM RATINGS

### DESIGN-CENTER VALUES, EACH SECTION

Plate Voltage	300 Volts
Plate Dissipation	1.5 Watts
DC Cathode Current	18 Milliamperes
Heater-Cathode Voltage†	
Heater Positive with Respect to Cathode	90 Volts
Heater Negative with Respect to Cathode	90 Volts

† When the 6386 is used as a cascode amplifier and the two sections are connected in series, the heater-cathode voltage of the grounded-grid stage may be as high as 250 volts maximum with the heater negative with respect to the cathode.

## CHARACTERISTICS AND TYPICAL OPERATION

### CLASS A<sub>1</sub> AMPLIFIER, EACH SECTION

Plate Voltage	100 Volts
Cathode-Bias Resistor	200 Ohms
Amplification Factor	17
Plate Resistance, approximate	4250 Ohms
Transconductance	4000 Micromhos
Plate Current	9.6 Milliamperes
Grid Voltage, approximate	
Gm = 100 Micromhos	—16 Volts

### CASCODE AMPLIFIER—SEE CIRCUIT DIAGRAM

Plate-Supply Voltage	300	200 Volts
Plate Load Resistor	10000	0 Ohms
Voltage-Divider Supply Voltage	250	200 Volts
Grid-Supply Voltage	—5	—2 Volts
Cascode Transconductance		4000 Micromhos
Cascode Plate Current		10.5 Milliamperes
Third Harmonic Distortion		
Esig = 1.0 Volts, Peak	0.5	.... Percent

## SPECIAL TESTS AND RATINGS

### Inoperatives Control

Minimum continuous operating time under life-test conditions or equivalent for all tubes prior to characteristics testing . . . . . 46 Hours

### Heater-Cycling Rating

Cycles of Intermittent Operation, minimum . . . . . 2000 Cycles  
Ef = 7.5 volts cycled for one minute on and one minute off. Eb = Ec = 0 volts. Ehk = 135 volts with heater positive with respect to cathode.

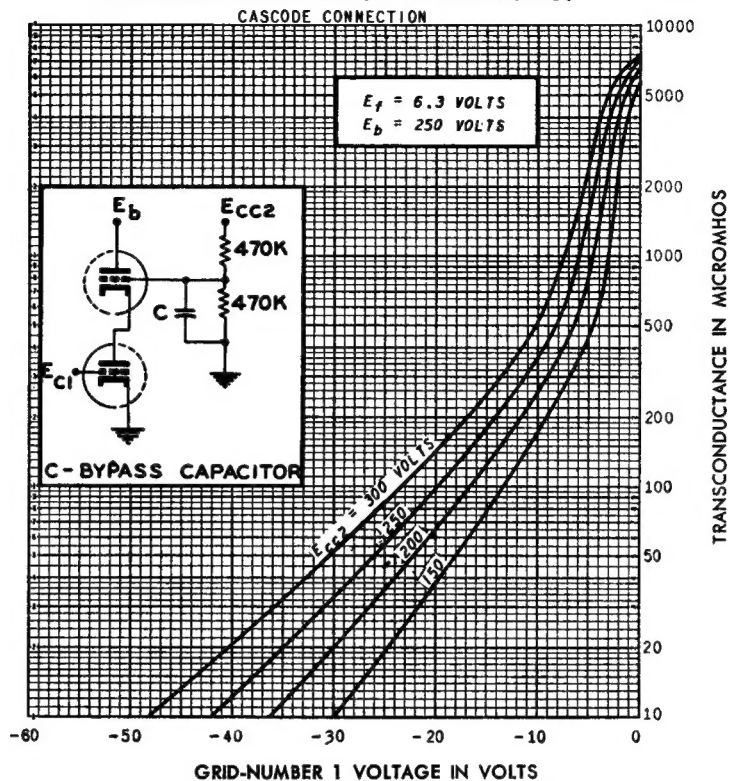
### Shock Rating

Impact Acceleration in Any Direction . . . . . 600 G  
Forces as applied by the Navy-type, High Impact (flyweight) Shock Machine for Electronic Devices or its equivalent.

### Fatigue Rating

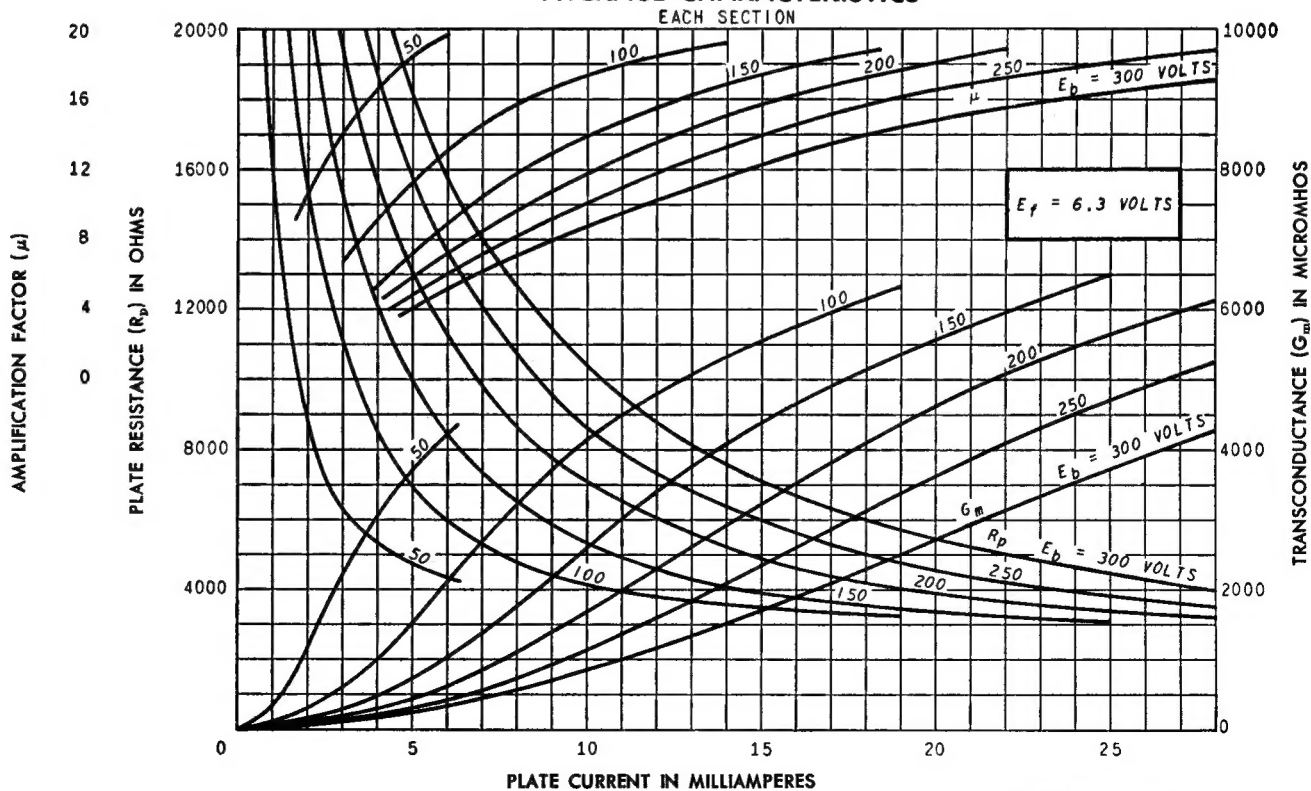
Vibrational Acceleration in Any Direction . . . . . 2.5 G  
Vibrational forces for a period of at least 100 hours at a frequency of 25 cycles per second.

# AVERAGE TRANSFER CHARACTERISTICS



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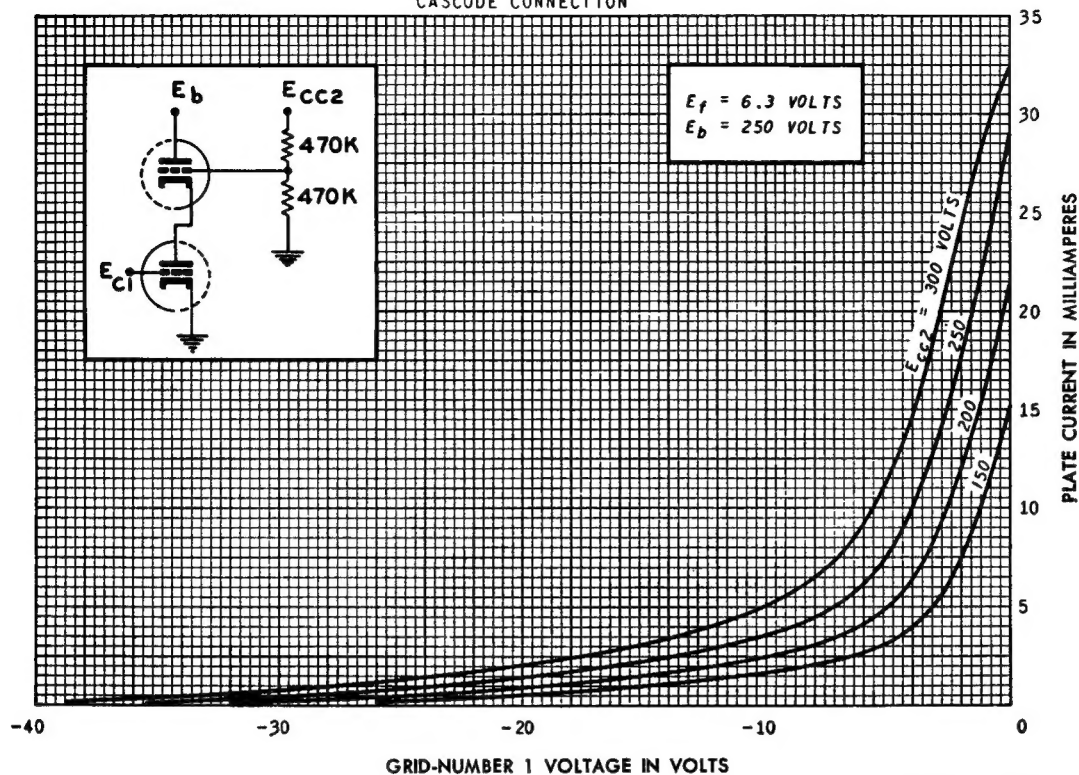
# AVERAGE CHARACTERISTICS



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## AVERAGE TRANSFER CHARACTERISTICS

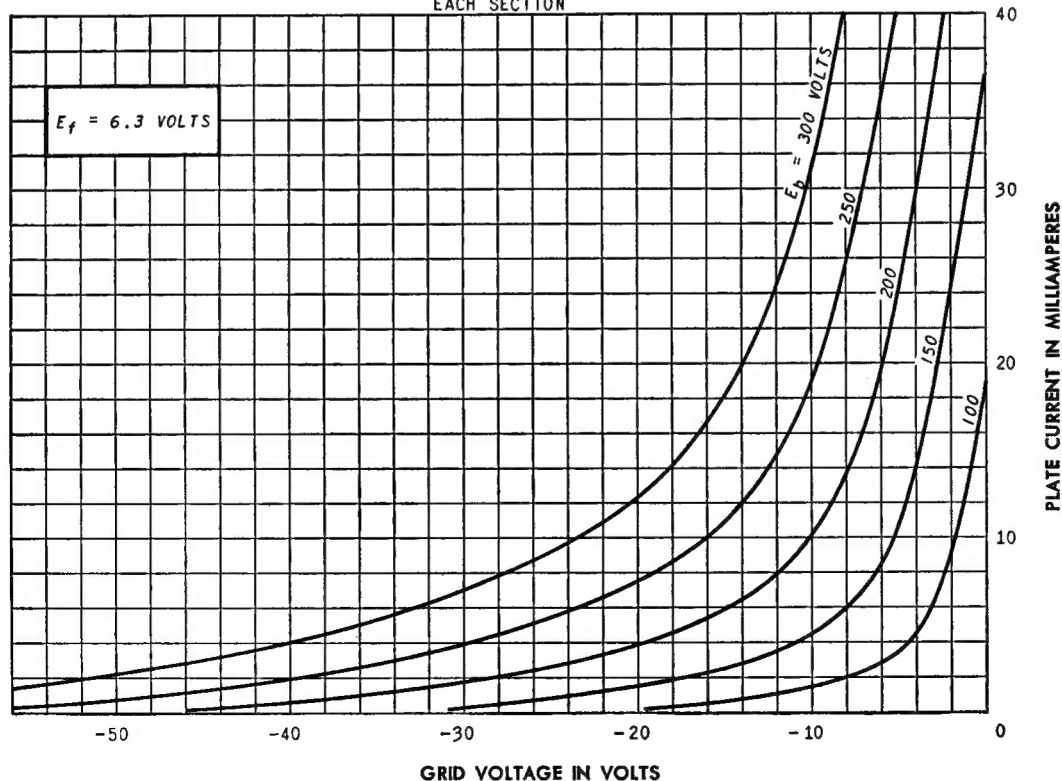
CASCADE CONNECTION



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## AVERAGE TRANSFER CHARACTERISTICS

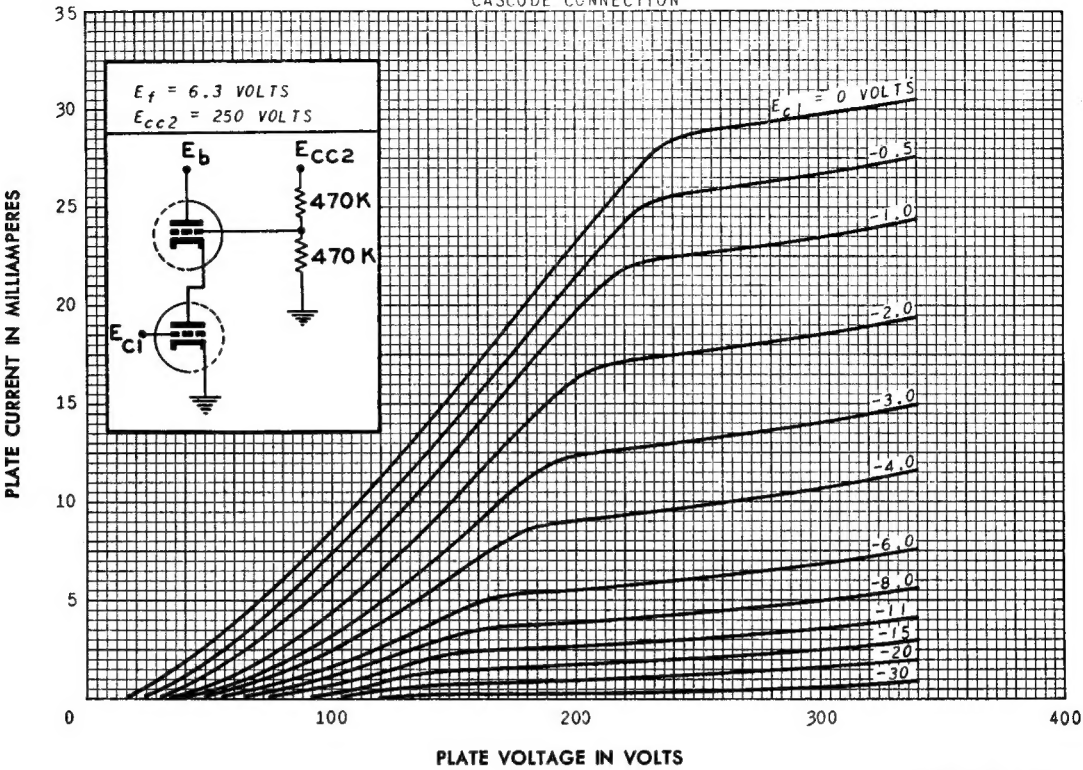
EACH SECTION



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AVERAGE PLATE CHARACTERISTICS

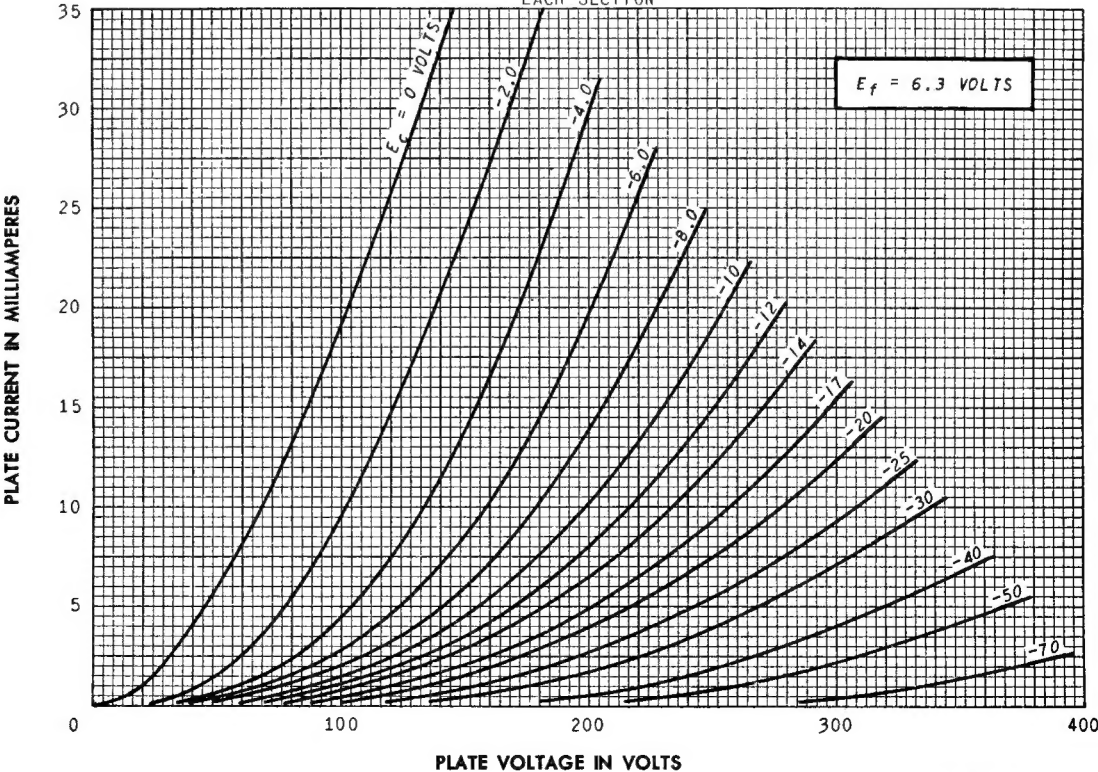
CASCODE CONNECTION



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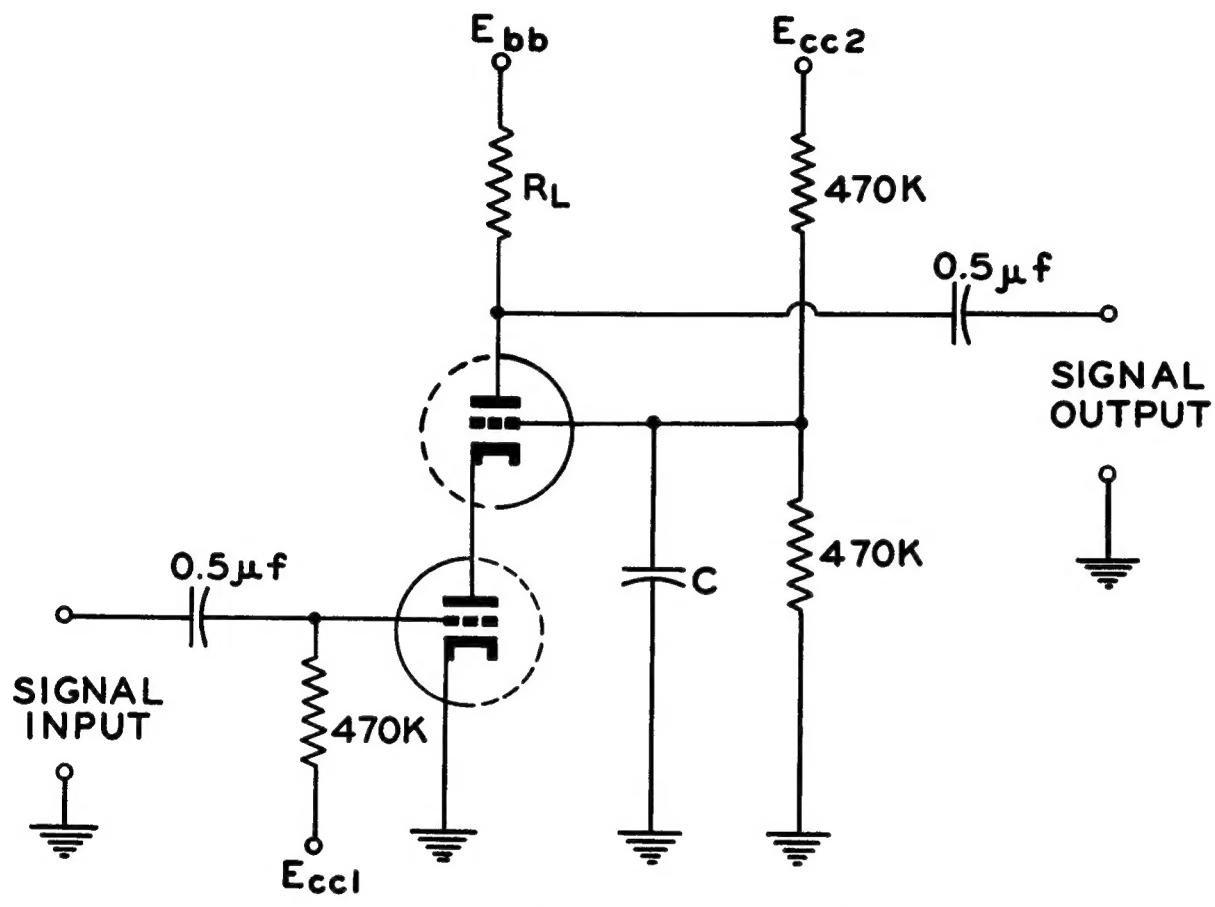
AVERAGE PLATE CHARACTERISTICS

EACH SECTION



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# TYPICAL CIRCUIT FOR CASCODE OPERATION



C - BYPASS CAPACITOR